

# Surface Matters

*What Arizonans are doing with geospatial technology*



Newsletter of the Arizona Geographic Information Council

## Ambulance Service Embraces Spatial Technology

**Marlene Shields**

*Life Line Ambulance Co.*

You're probably aware that police and fire services throughout the country are incorporating GPS and GIS into their operations to increase response times and otherwise make their services more effective. You may not have considered that private emergency services are doing the same thing. One excellent example is the Life Line Ambulance Company, which is using the latest technology to make improvements throughout the cities and counties it serves.

Life Line Ambulance is an emergency medical services company located in Prescott. Established in 1956, it has grown to become the largest ambulance service in northern Arizona. Its service area covers 8500 square miles, mostly located in Yavapai County, with portions in Maricopa and Coconino Counties. Operations go on 24 hours a day, seven days a week, with 29 ambulances at 7 strategically placed stations.

Rapid response times are critical for EMS services. One very important element is, "where is the emergency?" GIS is used at Life Line Ambulance to locate emergencies and efficiently route ambulances to them; to enable the study of predictive analysis, such as density maps derived from call histories; and to perform real-time deployment assignments that show optimum location as a function of road impedance.

The dispatch center runs on Computer-Aided-Dispatch (CAD) software from Zoll Medical. It has an integrated GIS module that was created in Map Objects, and is being updated with Arc Objects. The



Some of the dedicated staff of Life Line Ambulance

live server is updated with shapefiles exported from geodatabases in ArcMap.

The street centerline and address geodatabase is the crux of the dispatch operation. Each ambulance has a wireless GPS that is picked up on the CAD display. When a call is taken, the address is geocoded and the nearest ambulance is located with the Automatic Vehicle Location service.

With regard to daily GIS operations, most of the effort focuses on validating county centerline and address data. We take the counties' street and

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## Ambulance Service

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address data, and go out and validate it. Yavapai County has supplied other layers such as annexation boundaries, road sign locations, etc. The rest of the data is either obtained with a GPS or built in-house.

We have three resource-grade (3m) data collectors with integrated WAAS capability. WAAS is the Wide Area Augmentation System operated by the federal government, consisting of ground stations that broadcast corrections to GPS signals. Most of our area is rural, and some of the parcels are 40+ acres. It's not exactly nano-accuracy, but it works well for this application. I have set up the handheld wireless GPS units with ArcPad, and taught the emergency medical technicians (EMTs) how to collect data while they are in the communities. Cory Gardener, an Intermediate Emergency Medical Technician (IEMT) Supervisor-in-Training, has been instrumental in helping to teach the crews. Other than validating existing addresses and collecting new street and address data, we collect information on speed limits, road impedance, traffic direction, flood inundation areas, and the locations of such facilities as schools, church camps, fire stations, police stations, hospitals, and air ambulance helipads. When ambulances are contracted to stage for public gatherings such as races and holiday events, the event locations are digitized in.

Currently about 10 people in the company are trained for data collection. I plan on training more to produce a bigger resource pool, because the nature of scheduling is sporadic.

We have a working relationship with all agencies in our service area. We do work-share with Yavapai County and the municipalities in the quad-city area (Prescott, Prescott Valley, Chino Valley, and Dewey-Humboldt); that is, cities and towns contribute data to Yavapai County, then the county creates parcels and makes them available to law enforcement and emergency medical services. The entire community gains through data sharing and standardization.

Because the area is growing so fast, there is a need for ground proofing street address ranges and names. Life Line EMTs equipped with ArcPad-enabled PDAs validate and correct the data in their down time.

◇

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*Previous issues of Surface Matters are available on the AGIC web site.*

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***Surface Matters*** is the quarterly newsletter of the Arizona Geographic Information Council. It is written for those who want to stay in touch with the vision and activities of AGIC and with the continuing growth of GIS in Arizona.

Your comments about this publication are always welcome. Please send all correspondence to the editor.

Readers are invited to submit articles that they wish to be considered for publication. The author retains all copyrights. Please let the editor know if the article has been published elsewhere.

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## GIS at Mesa Community College

Attending a university isn't a prerequisite for getting a solid foundation in spatial technology. Mesa Community College (MCC) has a vibrant GIS program that offers students a sound academic basis, practical applications, and work experience.

### The Program

MCC offers a program that leads to a Geographic Information Systems Technician Certificate. The curriculum stresses geographic concepts and principles while applying practical exercises using geospatial software. The guiding philosophy is that a student so equipped will be able to apply his GIS knowledge to any given field and be able to adapt to whatever GIS software he encounters.

Students in the program can follow one of three different tracks. The User/Analyst track is for those interested in producing, editing, and analyzing spatial data. The Programmer/Developer track includes many of the methods found in the User/Analyst track, but its emphasis is on developing GIS software applications through programming. The final option is the Bachelor of Science: GIS Emphasis track, which is for those students who want to transfer to a university to pursue a Bachelor's degree with a GIS emphasis. The certificate requires four core GIS classes, plus four additional classes that depend on the student's academic path, plus an internship.

### The Courses

The GIS courses at MCC consist of beginning, intermediate, and advanced GIS using ArcGIS software, and a class in cartography and geospatial technology. Each is taught one night per week, from 5:45 to 8:30 PM. Significant lab time is available during class sessions, but the lab/classroom is also available for limited periods outside of class. Typically it is open for 10 hours per week during the weekdays, plus four hours on Saturday. The lab has 20 computer stations.

The classes are taught at night because of the demographics of the student population. Most of the demand comes from working adults who are seeking to increase their skills for their careers. Attempts have been made to teach the classes during the daytime, but most of the students who are just coming up through high school aren't aware of GIS and don't enroll in the program.

The certificate program is administered by the Geography Department, which offers the core GIS courses and the internship credits. The additional courses for the three different certificate tracks are given by the Computer Information Systems and Mathematics Departments.

Pursuing an internship at MCC is much like pursuing one at a university. A student must sign up for the internship class and will receive from one to three credits depending on how many hours are

worked. The formula is one credit hour per twenty hours of work to be completed within the semester. The internship entails identifying a GIS-related project that meets instructor approval. The person who will be supervising the project completes a contract that includes a description of the tasks and goals the intern will be expected to perform during the internship. Weekly timesheets signed by the student and supervisor are submitted to the instructor once the internship has begun.

Finding an internship can be a bit haphazard. Sometimes a company or government agency will contact the college to offer an internship and the position will be announced in class. On other occasions a student must contact potential employers to find out if an internship is available. Some internships are paid, others are not.

### The Future!

Mesa Community College is not content to maintain a geospatial status-quo. Many plans for future growth are in the works.

- A geography listserve will soon be operational, which will allow interested students and teachers to exchange information and post job notices.
- The following new classes are in development:
  - Fall 2006 – Introduction to Spatial Database I
  - Spring 2007 – Introduction to Internet Map Server
  - Spring 2007 – Introduction to Remote Sensing (ERDAS)
  - Fall 2007 – an online course in introductory GIS
- An Engineering track will be added to the options for the GIS certificate.
- Partnerships between the Geography Department and other departments on campus will be forged, allowing for the introduction of geographic principles and spatial technology into other academic disciplines.
- Partnerships between the college and local businesses and organizations will be pursued, allowing MCC to more directly serve the interests of the community.
- A new Associate's degree, Applied Science in GIS, will be developed.

### Further Information

MCC home: [www.mc.maricopa.edu](http://www.mc.maricopa.edu)

Admissions:

[www.mc.maricopa.edu/students/admissions](http://www.mc.maricopa.edu/students/admissions)

Career services:

[www.mc.maricopa.edu/students/career](http://www.mc.maricopa.edu/students/career)

Geography Department:

[www.mc.maricopa.edu/dept/d10/gph](http://www.mc.maricopa.edu/dept/d10/gph)

GIS Certificate details:

[www.mc.maricopa.edu/dept/d10/gph/gistc/index.html](http://www.mc.maricopa.edu/dept/d10/gph/gistc/index.html)

### GIS Program Coordinator

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## Microcomputers in Education: GIS Comes Out Strong

**Shea Lemar**

*GIServices, ASU*

The GIS track at Arizona State University's annual Microcomputers in Education Conference (MEC) was a great success. The conference ran Saturday, March 11<sup>th</sup> through Monday, March 13<sup>th</sup>.

Charlie Fitzpatrick, manager of ESRI's K-12 education program, was Saturday's featured speaker. Through his presentation, "Spatial Thinking and GIS", he was able to enlighten many Arizona teachers as to the power of GIS in education. A variety of hands-on workshops and presentations over the three-day conference allowed attendees to experience GIS and learn how other educators were using it in their classrooms. Kristen Kurland, professor at Carnegie Mellon University, taught teachers the basics of GIS using a lesson from her best-selling book *GIS Tutorial*. Authors of *Mapping Our World*, Lyn Malone and Anita Palmer, gave teachers the chance to work on classroom lessons which utilized GIS in their many packed presentations. Bush Leadership Fellow and Einstein Fellow Cassie Soeffing's presentation on the use of NASA imagery in the classroom was so popular that she spoke to an overflowing audience twice during the three-day conference. One of the most popular presentations was given by science teacher Betsy Youngman's 8<sup>th</sup> grade students who used GIS to study climate issues in the Channel Islands.

In a continuing effort to support GIS education throughout the state, AGIC sponsored a \$1500 scholarship fund. AGIC's generous support allowed four Arizona teachers, five national GIS educators and an AGIC representative to attend the conference. The Arizona teachers will be bringing GIS back to their classrooms where they teach social studies, geography, history, science and reading. Thanks to the AGIC scholarships, the teachers were exposed to students who spoke on the power of GIS in their classrooms, GIS lessons for all subject matter, NASA workshops, networking opportunities with other teachers, GIS in education support people, and more. All of the educators are looking forward to attending MEC next year and bringing their coworkers along with them. ♦

## GIS at MCC

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### Some organizations that have hired interns

Aerials Express  
Engineering Mapping Solutions (Civil/GIS Development)  
Gleave & Company  
Project Engineering Consultants (Civil Engineering)  
City of Chandler  
City of Gilbert  
Maricopa County Flood Control  
Arizona Department of Environmental Quality  
Arizona Department of Mines  
Arizona Department of Water Resources ♦



Kristen Kurland (top) and Lyn Malone (below) inform conference attendees about using GIS in the classroom.

## Phoenix College to Begin GIS Program

Starting in the fall semester of 2006, the Phoenix College Biology Department will offer a new, 4-semester GIS program that can lead to GIS Technician certification. The program is called Geospatial Technology for Environmental Sciences. It will consist of four 4-credit classes, at the end of which students can take a certification test.

All of the classes will stress a project management approach, guiding students through the steps of collecting, editing, analyzing, and presenting data. Along the way a wide range of concepts and applications will be introduced and implemented. The first course will introduce beginning concepts and skills and will make use of GIS software, GPS hand units, aerial and satellite imagery, and even a satellite orbit simulation program. The second through fourth courses will use ArcGIS, some of its extensions, and other software for the exercises and projects.

Each class is based on working through projects, not simply doing generic exercises. Exercises will be completed as part of the learning process, but the skills learned will then be implemented in structured applications. The final semester will be a self-directed class in which the students devise, implement, and complete projects on their own.

A unique aspect of the program is that the data are customized to the campus and its surrounding community. The data used for projects will either be collected on the grounds of Phoenix College, or will be Maricopa County layers that are supplied in class.

The program will use a comprehensive curriculum called SPACESTARS, an acronym for Spatial Projects And Community Exchange/Spatial Technology And Remote Sensing. This curriculum was developed jointly by Digital Quest, Inc. and the Berkeley Geo-Research Group. The test that students can take at the end of the four semesters will be for the STARS GIS Technician Certification. The certificate will be awarded by the SPACESTARS organization, not by Phoenix College. The certification is endorsed and sponsored by the Mississippi Enterprise for Technology, a partnership of 29 public and private institutions including the NASA Stennis Space Center, the U.S. Army Corps of Engineers, and the Mississippi universities.

For descriptions of the courses and class schedules:  
[www.phoenixcollege.edu/biology](http://www.phoenixcollege.edu/biology)

To learn about the curriculum developers and sponsors:  
[www.spacestars.org](http://www.spacestars.org)  
<http://mset.org> ♦

## Mesa Community College Seeks GIS Instructors

If you have a solid background in GIS and a flair for explaining how and why things work, you might want to consider becoming an adjunct faculty member at Mesa Community College.

The GIS program at MCC is in fine shape, but the GIS coordinator is currently the only instructor! If her plans for expansion of the program are to come to fruition, she will need a few people to join her staff.

This is an excellent opportunity to contribute to the profession. The continued expansion of GIS requires trained employees, and that requires people to train them. It's also a terrific chance to expand your career horizons and increase your knowledge of GIS. You never learn anything so well as when you have to teach it to others.

You need not have a Master's degree to teach if you have sufficient experience. Keep in mind also that most of the people in the GIS program are working adults, so you will have serious students who understand the value of the technology.

Give it some thought, and urge your colleagues to give it their own thought. For information, contact Karen Blevins, MCC GIS Coordinator, at 480-461-1622, or at [kevins@mail.mc.maricopa.edu](mailto:kevins@mail.mc.maricopa.edu). The future geospatial work force of America will thank you! ♦

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## Promises, Promises

In the last issue we said that this issue would contain a review of the *Eyes in the Sky* Student GIS Showcase, which took place last April at Tempe High School. Due to circumstances beyond our control and a measure of editorial incompetence, we were not able to bring you the review. We regret this severely, as the showcase was the culmination of many months of work by both students and teachers. *Eyes in the Sky* is an innovative program that enables high school teachers to bring spatial technology into the classroom.

We apologize for getting your hopes up and will be more careful about predicting the future in the future. ♦



## AGIC Roundup

- The AGIC data portal is being tested at the State Land Department and the Department of Environmental Quality. The portal will be a primary source of data sharing within the state. After it's up and running, AGIC will explore further data sharing possibilities as well.
- The Education Committee is making connections with Arizona's 4H clubs. 4H has a technical component and AGIC is helping local 4H affiliates to make spatial technology a part of their program.
- AGIC is seeking to get tribal representatives on the AGIC Board. The Outreach Committee is contacting tribal GIS coordinators for possible representation.
- AGIC is planning to host a series of workshops throughout Arizona in the fall of 2006. The workshops will address the many resources available to GIS groups. Stay tuned next fall for further updates.
- AGIC-L, Arizona's premiere GIS listserve, is becoming more popular! In May 2005 it had 250 subscribers. In May 2006 its membership had grown to 311 subscribers. Congratulations to the listserve!

### Contributors

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#### Photo Credits

Ambulance photo courtesy of Marlene Shields.  
MEC photos courtesy of Shea Lemar.



## Calendar of Events

### NORTHERN ARIZONA GIS USER GROUP QUARTERLY MEETING

JULY, 2006

DATE AND TIME TO BE ANNOUNCED

CONTACT: AARON SEIFERT, ASEIFERT@SWIAZ.COM

[HTTP://GROUPS.YAHOO.COM/GROUP/NAGIS\\_USERS](http://groups.yahoo.com/group/NAGIS_USERS)

### ESRI INTERNATIONAL USER CONFERENCE

AUGUST 7-11, 2006

SAN DIEGO CONVENTION CENTER

SAN DIEGO, CA

[WWW.ESRI.COM/EVENTS/UC](http://www.esri.com/events/uc)

### AGIC QUARTERLY BOARD MEETING

AUGUST 17, 2006

10:00 AM

LOCATION TO BE ANNOUNCED

[HTTP://AGIC.AZ.GOV/BOARD/MEETINGS.HTM](http://agic.az.gov/board/meetings.htm)

### GIS CAREER FEST

OCTOBER 11, 2006

1:30 - 3:30 PM

ASU MEMORIAL UNION

THIS IS A SPECIAL EVENT COMING UP NEXT FALL. YOU WILL BE HEARING ABOUT IT THROUGH AGIC-L, THIS NEWSLETTER, INSTRUCTORS, AND ELSEWHERE.

### SWUG CONFERENCE

OCTOBER 14-18, 2006

DU BOIS CONFERENCE CENTER

NORTHERN ARIZONA UNIVERSITY

FLAGSTAFF, AZ

[WWW.SWUGGIS.ORG](http://www.swuggis.org)

DUE TO THIS CONFERENCE BEING HELD IN ARIZONA, THE ANNUAL AGIC CONFERENCE WILL NOT TAKE PLACE THIS YEAR.